

Local Climate Health Adaptation: Research and Practice in Michigan

**Michigan Climate and Health
Adaptation Program (MICHAP)**

Lorri Cameron, PhD
Principal Investigator

Dominic Smith, MSA
Project Manager/Health Educator



Presentation Outline

- **Describe state program development**
- **Focus on local adaptation work**
 - **Partnerships to develop tools and capacity**
 - **Role of researchers, experts**
- **Lessons learned, challenges**

Michigan Background

- **Prior to 2009 :**
 - State Climate Action Plan written, not implemented
 - No state-level adaptation plan
 - Some work w/in state on health impacts, not coordinated
- **2009 – 2010: CDC funding via ASTHO to:**
 - Conduct statewide public health needs assessment of knowledge and capacity gaps
 - Create a strategic plan with partners for addressing gaps
- **2010 – 2013: CDC Capacity Building grant (Category 2)**
 - Implement the State Strategic Plan

Michigan Climate & Health Adaptation Plan (MICHAP)

Goal: *Integrate climate adaptation into public health practice*

- MDCH to provide leadership, tools, resources
- Build state and local capacity thru training, partnerships
- Focus on local public health and community adaptation

Why local focus?

- Michigan has 45 Local Health Depts, 8 EP regions
- Much public health, planning /governance is local
- Partner with existing planning, emergency response, community improvement activities
- Often face less political barriers
- Local health severely under-resourced & needs support

Partnerships for Tool Development

- **Dr. Marie O'Neil, University of Michigan**
 - *I-HEAT decision assessment tool*
 - *heat morbidity/mortality, vulnerability research*
- **Dr. Laura Schmidt-Olabisi, Michigan State University**
 - *MMHM dynamic heat event model*
- **Human Impact Partners, HIA practitioners**
 - *Use of Health Impact Assessment in climate health adaptation*
- **Dr. Sue Grady, Michigan State University**
 - *Mapping population vulnerability to climate health effects*
- **Great Lakes Integrated Science + Assessments (GLISA)**
 - *Downscaled climate projections*

Heat Event Response Tools

- **Local health officers lack information, expertise to respond effectively**
- **Example: cooling centers underutilized; why?**
- **Surveys revealed lack of awareness, sociocultural barriers among vulnerable subgroups**
- **Researchers interested in tool development teamed up with MICHAP for piloting, evaluation with local health officers, planners, EPCs**

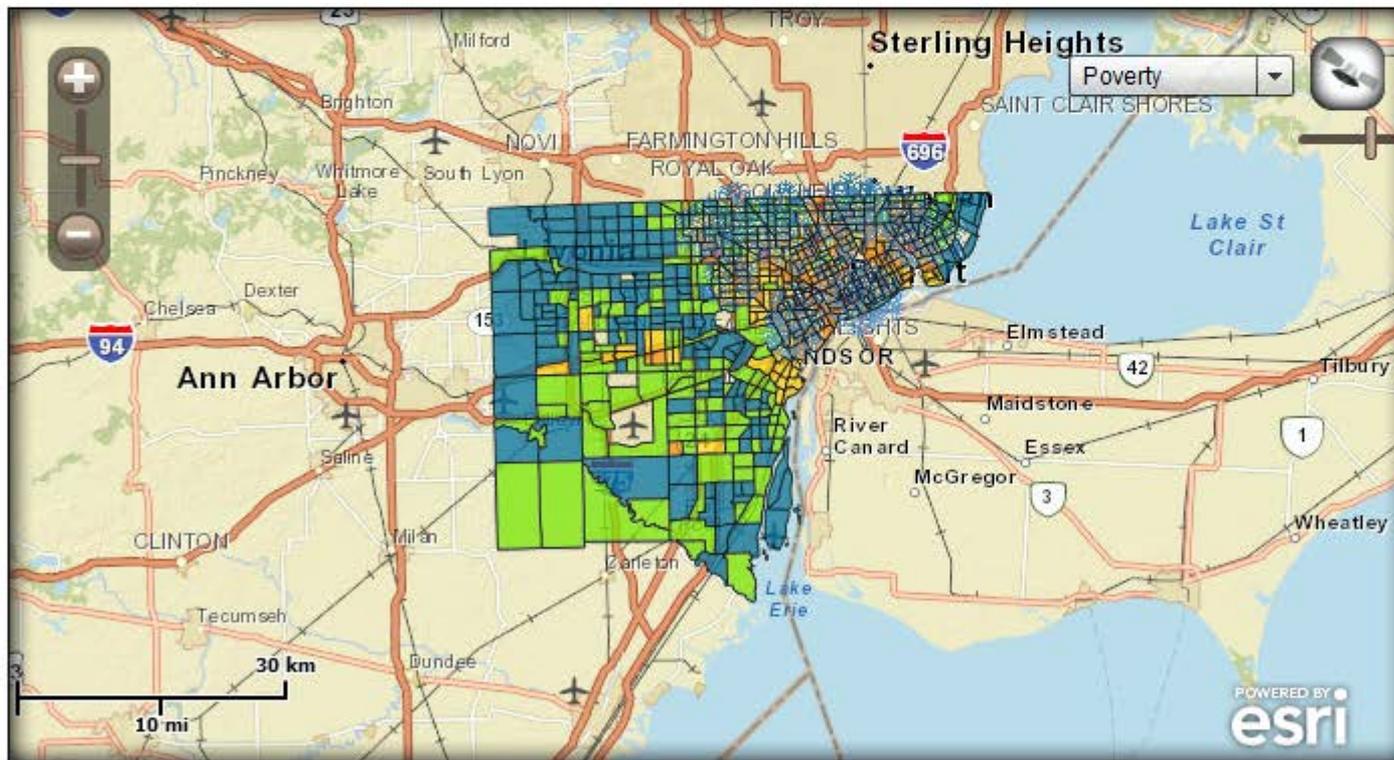
Internet-based Heat Evaluation and Assessment Tool (I-HEAT)

- **Web-based geospatial tool for guiding heat planning and response**
- **Population sociodemographic and health measures**
- **Satellite measures of temperature, vegetation**
- Marie O'Neil, Katie Conlon, Natalie Sampson (U Mich)
- Geoff Jacquez, Susan Maxwell, Robt. Rommel(Biomedware)
 - Developmental funding by NASA

I-HEAT Heat Event Planning Software



- At Risk Areas
- Temperature
- Demographics
- Vulnerability
- About



Census Tracts

- 0-5%
- 5-15%
- 15-30%
- 30-50%
- 50-100%

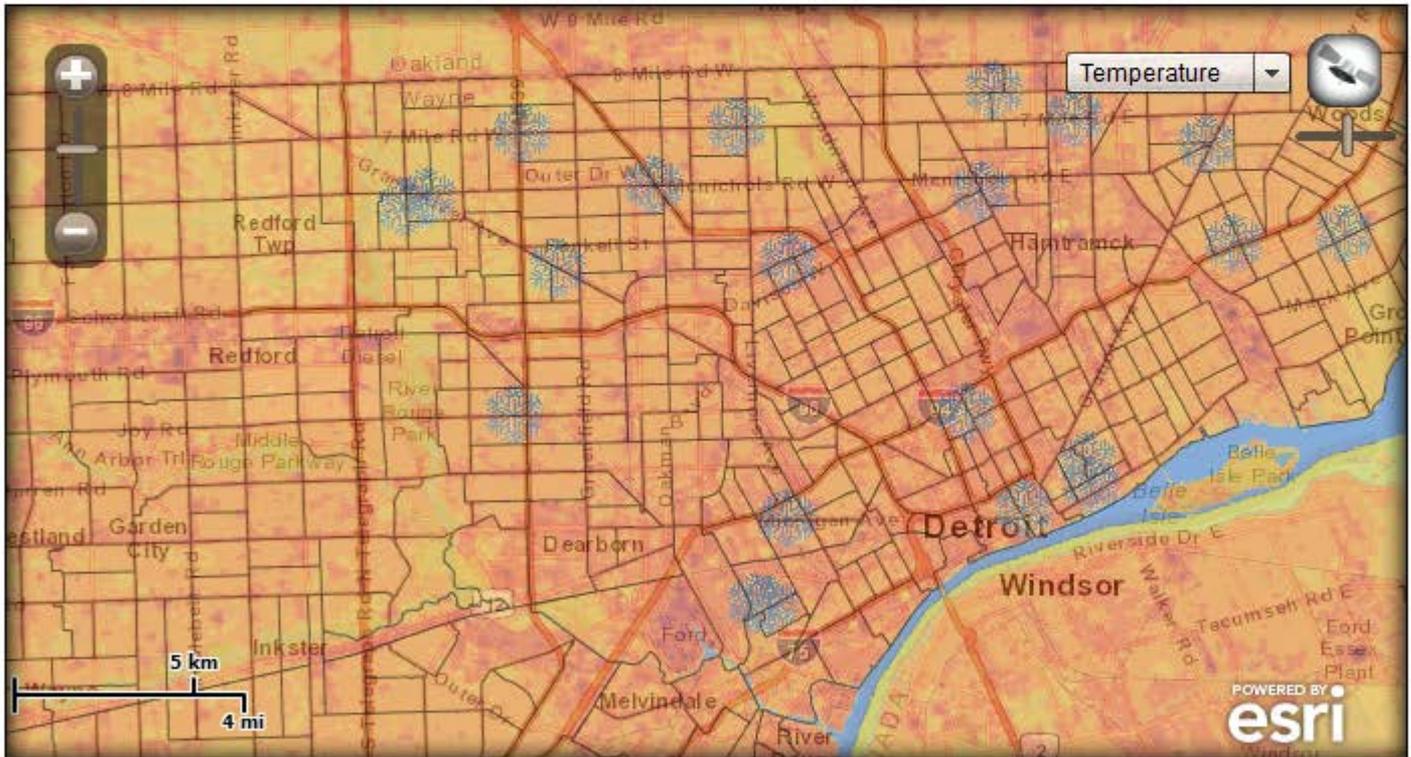
Population characteristics commonly used to identify populations vulnerable to heat exposure.

Scale = Census tract
Source: 2000 Census

I-HEAT Heat Event Planning Software



- At Risk Areas
- Temperature**
- Demographics
- Vulnerability
- About



Temperature

- Water
- 60-69
- 70-79
- 80-84
- 85-89
- 90-94
- 95-99
- 100-104
- 105-109

Land Surface Temperature (°F) derived from Landsat 5 satellite image September 1, 2002

Scale = 120 m



The Mid-Michigan Heat Model:
A Modeling Framework for Informing Decision Maker Response to
Extreme Heat Events in Michigan Under Climate Change

Laura Schmitt Olabisi, Ralph Levine, Stuart Blythe
Michigan State University

Funded by the Great Lakes Integrated Sciences and Assessments Center

Appendix A: Model Interface with Baseline Model Settings

The Mid-Michigan Heat Model

Total Deaths

60

Total Hospitalizations

64

How many people are at risk?
(millions)

0.0000 5.0000
0.0819 x 10⁶

What proportion of people have air conditioning?

0.0000 1.0000
0.3000

Is there a brownout?

How many cooling centers do you open?

1 20
20

Can cooling centers accommodate pets? (proportion)

0.0000 1.0000
0.0000

Is there a media campaign to educate people about heat? (proportion who receive message)

0.0000 1.0000
0.0000

Reduction of the urban heat island effect (degrees F)

0.0000 4.3000
0.0000

How many people have access to public transportation? (proportion)

0.0000 1.0000
0.3800

Variable Description	Baseline Setting	Alternate Setting	Effect on Deaths (compared to baseline scenario)	Effect on Hospitalizations (compared to baseline scenario)
Brownout?	No	Yes	+ 92%	+ 58%
Percentage of homes with air conditioning	30% have A/C	All have A/C	- 98%	- 100%
How many cooling centers?	2	20	+/- 0%	+/- 0%
Accommodation of pets at cooling centers?	None	100%	+/- 0%	+/- 0%
Proportion of people who encounter media message about heat	0	100%	-95%	- 83%
Urban heat island effect	4.3 degrees	0 degrees	- 70%	- 39%
Access to public transportation	38% of vulnerable population	100% of vulnerable population	+/- 0%	+/- 0%

Table 1. Sensitivity analysis for Mid-Michigan Heat Model. Baseline conditions represent a 1995 Chicago-style heat wave in Detroit with the settings in the second column (No brownout, 30% of homes with A/C, etc., which results in 60 deaths and 64 hospitalizations).

Health Impact Assessment (HIA)

- Incorporate health into community planning & decision-making
- Describes health risk/benefit; identifies health disparities, vulnerable subgroups
- Engages stakeholders in the process
- MICHAP Goal: Build capacity, support climate-related HIAs
- Fits with existing programs: *Complete Streets, Healthy Communities, Sustainable Communities*
- Training, technical support by Human Impact Partners
<http://www.humanimpact.org/hia>

Michigan's Climate-Adaptation HIAs

- **Grand Rapids:** *improving greenspace, nonmotorized transportation in development of Michigan Avenue Corridor*
- **East Lansing:** *reducing traffic, increasing walkability in high-traffic neighborhood with schools*
- **Ann Arbor:** *Targeted tree planting to increase canopy in heat-vulnerable neighborhoods*
- All 3 HIAs were collaboration of city planners with local, state health departments

Lessons Learned

- **Partnerships essential for success of health adaptation programs**
- **Researchers bring subject-matter expertise to develop needed tools and models**
- **Public health contributes local knowledge; field tests and validates model**
- **Need to understand social, behavioral factors influencing risk, to identify best interventions**
- **Models/tools must be relevant, understandable, to be useful to decision-makers**

Thank you

Contact us:

– Lorri Cameron, cameronl@michigan.gov

– Dominic Smith, smithd82@michigan.gov

Web: www.michigan.gov/climateandhealth